

IN THE CLAIMS

A complete listing of claims in the instant application is provided below as follows:

- 1 1. (Currently amended) An orifice plate comprising:
2 a plate adapted to be positioned in a conduit and extend
3 across a transverse cross-section thereof, said plate defined
4 by a central circular region having a radius R_c and a
5 ring-shaped region surrounding said central circular region,
6 said ring-shaped region having a plurality of holes
7 formed therethrough with ones of said plurality of holes
8 centered at each radius R of said ring-shaped region
9 satisfying a flow-based relationship
10
$$A_R = a / (X_R V_R^b)$$

11 where A_R is a sum of areas of said ones of said
12 plurality of holes having centers at said radius R ,
13 X_R is a flow coefficient at said radius R that is equal
14 to $(\rho K)_R$ where ρ_R is a density of a fluid that is to flow
15 through the conduit at said radius R and K_R is a flow
16 correction factor associated with the fluid that is to flow
17 through the conduit at said radius R ,
18 V_R is a velocity of the fluid that is to flow through
19 the conduit at said radius R ,
20 b is a constant selected to make at least one process
21 variable, associated with the fluid that is to flow through

22 the conduit, approximately equal at each said radius R, and
23 a is a constant that is equal to $(X_R A_R V_R^b)$ at each said
24 radius R.

1 2. (Original) An orifice plate as in claim 1 wherein each of
2 said plurality of holes is beveled at each surface of said
3 plate.

1 3. (Original) An orifice plate as in claim 1 wherein each of
2 said plurality of holes has a longitudinal axis that is
3 parallel to a longitudinal axis of the conduit.

1 4. (Original) An orifice plate as in claim 1 wherein said
2 central circular region has at least one circular hole formed
3 therethrough.

1 5. (Currently amended) An orifice plate as in claim 4
2 wherein said at least one circular hole comprises a single
3 circular hole having a radius $R_0 \leq R_c$ wherein $R_0 \leq R_c$.

1 6. (Original) An orifice plate as in claim 1 wherein each of
2 said plurality of holes is circular.

1 7. (Original) An orifice plate as in claim 1 wherein each of
2 said plurality of holes is an arc-shaped slot.

1 8. (Currently amended) An orifice plate comprising:
 2 a plate adapted to be fixedly positioned in a conduit
 3 and extend across a transverse cross-section thereof that is
 4 circular, said plate defined by a central circular region
 5 having a radius R_0 , R_c and a ring-shaped region surrounding
 6 said central circular region, said ring-shaped region having
 7 an inner radius $R_{in}=R_0$, $R_{in}=R_c$ and an outer radius R_{out} ,
 8 said ring-shaped region having a plurality of holes
 9 formed therethrough with ones of said plurality of holes
 10 centered at each radius R , $R_{in}<R<R_{out}$, of said ring-shaped
 11 region satisfying a flow-based relationship

$$12 \quad A_R = a / (X_R V_R^b)$$

13 where A_R is a sum of areas of said ones of said
 14 plurality of holes having centers at said radius R ,
 15 X_R is a flow coefficient at said radius R that is equal
 16 to $(\rho K)_R$ where ρ_R is a density of a fluid that is to flow
 17 through the conduit at said radius R and K_R is a flow
 18 correction factor associated with the fluid that is to flow
 19 through the conduit at said radius R ,
 20 V_R is a velocity of the fluid that is to flow through
 21 the conduit at said radius R ,
 22 b is a constant selected to make at least one process
 23 variable, associated with the fluid that is to flow through
 24 the conduit, approximately equal at each said radius R , and
 25 a is a constant that is equal to $(X_R A_R V_R^b)$ at each said
 26 radius R .

1 9. (Original) An orifice plate as in claim 8 wherein each of
2 said plurality of holes is beveled at each surface of said
3 plate.

1 10. (Original) An orifice plate as in claim 8 wherein each
2 of said plurality of holes has a longitudinal axis that is
3 parallel to a longitudinal axis of the conduit.

1 11. (Original) An orifice plate as in claim 8 wherein said
2 central circular region has at least one circular hole formed
3 therethrough.

1 12. (Currently amended) An orifice plate as in claim 11
2 wherein said at least one circular hole comprises a single
3 circular hole having a radius $R_0 \leq R_c$ wherein $R_0 \leq R_c$.

1 13. (Original) An orifice plate as in claim 8 wherein each
2 of said plurality of holes is circular.

1 14. (Original) An orifice plate as in claim 8 wherein each
2 of said plurality of holes is an arc-shaped slot.

1 15. (Currently amended) An orifice plate comprising:

2 a plate adapted to be positioned in a conduit and extend
3 across a transverse cross-section thereof, said plate defined
4 by a central circular region having a radius R_0 R_c and a
5 ring-shaped region surrounding said central circular region,
6 said ring-shaped region having a plurality of holes
7 formed therethrough with said plurality of holes at each
8 radius R of said ring-shaped region satisfying a flow-based
9 relationship

10
$$A_R = a / (X_R V_R^b)$$

11 where A_R is a sum of areas defined by said plurality of
12 holes at said radius R ,

13 X_R is a flow coefficient at said radius R that is equal
14 to $(\rho K)_R$ where ρ_R is a density of a fluid that is to flow
15 through the conduit at said radius R and K_R is a flow
16 correction factor associated with the fluid that is to flow
17 through the conduit at said radius R ,

18 V_R is a velocity of the fluid that is to flow through
19 the conduit at said radius R ,

20 b is a constant selected to make at least one process
21 variable, associated with the fluid that is to flow through
22 the conduit, approximately equal at each said radius R , and

23 a is a constant that is equal to $(X_R A_R V_R^b)$ at each said
24 radius R .

1 16. (Original) An orifice plate as in claim 15 wherein each
2 of said plurality of holes is beveled at each surface of said
3 plate.

1 17. (Original) An orifice plate as in claim 15 wherein each
2 of said plurality of holes has an axis extending through said
3 plate that is parallel to a longitudinal axis of the conduit.

1 18. (Original) An orifice plate as in claim 15 wherein said
2 central circular region has at least one circular hole formed
3 therethrough.

1 19. (Currently amended) An orifice plate as in claim 18
2 wherein said at least one circular hole comprises a single
3 circular hole having a radius $R_0 \leq R_c$ wherein $R_0 \leq R_c$.

1 20. (Currently amended) An orifice plate as in claim 15
2 wherein each of said plurality of holes extends continuously
3 from said radius R_0 R_c , and wherein each of said plurality of
4 holes increases in area with increases in said radius R.

1 21. (Currently amended) An orifice plate comprising:
2 a plate adapted to be fixedly positioned in a conduit
3 and extend across a transverse cross-section thereof that is
4 circular, said plate defined by a central circular region
5 having a radius R_c R_c and a ring-shaped region surrounding
6 said central circular region, said ring-shaped region having
7 an inner radius $R_{in}=R_c$ $R_{in}=R_c$ and an outer radius R_{out} ,
8 said ring-shaped region having a plurality of holes
9 formed therethrough with said plurality of holes at each
10 radius R , $R_{in}<R<R_{out}$, of said ring-shaped region satisfying a
11 flow-based relationship

12
$$A_R = a / (X_R V_R^b)$$

13 where A_R is a sum of areas defined by said plurality of
14 holes at said radius R ,

15 X_R is a flow coefficient at said radius R that is equal
16 to $(\rho K)_R$ where ρ_R is a density of a fluid that is to flow
17 through the conduit at said radius R and K_R is a flow
18 correction factor associated with the fluid that is to flow
19 through the conduit at said radius R ,

20 V_R is a velocity of the fluid that is to flow through
21 the conduit at said radius R ,

22 b is a constant selected to make at least one process
23 variable, associated with the fluid that is to flow through
24 the conduit, approximately equal at each said radius R , and

25 a is a constant that is equal to $(X_R A_R V_R^b)$ at each said
26 radius R .

1 22. (Original) An orifice plate as in claim 21 wherein each
2 of said plurality of holes is beveled at each surface of said
3 plate.

1 23. (Original) An orifice plate as in claim 21 wherein each
2 of said plurality of holes has an axis extending through said
3 plate that is parallel to a longitudinal axis of the conduit.

1 24. (Original) An orifice plate as in claim 21 wherein said
2 central circular region has at least one circular hole formed
3 therethrough.

1 25. (Currently amended) An orifice plate as in claim 24
2 wherein said at least one circular hole comprises a single
3 circular hole having a radius R_0 ~~$R_0 \leq R_c$~~ wherein $R_0 \leq R_c$.

1 26. (Currently amended) An orifice plate as in claim 21
2 wherein each of said plurality of holes extends continuously
3 from said radius R_0 R_c , and wherein each of said plurality of
4 holes increases in area with increases in said radius R .